

**We claim:**

1. A processing apparatus arranged to be coupled to a network of nodes linked together by physical connections, the processing apparatus comprising:

5 a receiver that operates to receive at least one logical connection parameter associated with each of at least one port within a plurality of the nodes; and

a processor, coupled to the receiver, that operates to process the received logical connection parameters in order  
10 to predict at least one physical connection between two of the ports within the plurality of nodes based upon the results of the processing.

2. A processing apparatus according to claim 1, wherein to  
15 process the received logical connection parameters, the processor operates to, for a first one of the two ports, determine at least one most probable port that the first port is physically connected to, this most probable port being the second of the two ports.

20 3. A processing apparatus according to claim 1, wherein to process the received logical connection parameters, the processor operates to, for a first one of the two ports, determine a set of most probable ports that the first port  
25 is physically connected to, this set of most probable ports including the second of the two ports.

4. A processing apparatus according to claim 3, wherein  
30 to determine a set of most probable ports that the first port is physically connected to, the processor operates to determine a port similarity variable for a plurality of the ports when compared to the first port; and insert all ports

that were determined to have the largest port similarity variable within the set of most probable ports.

5. A processing apparatus according to claim 4, wherein  
5 the port similarity variable for each of the ports when compared to the first port is equal to the number of logical connections that are identical between the first port and the particular port that the port similarity variable is being determined for.

10 6. A processing apparatus according to claim 1, wherein to process the received logical connection parameters, the processor operates to sort the ports within the plurality of nodes based upon the number of logical connections at the  
15 ports; and, for a first one of the two ports, determine a set of most probable ports that the first port is physically connected to, this set of most probable ports including the second of the two ports.

20 7. A processing apparatus according to claim 6, wherein to determine a set of most probable ports that the first port is physically connected to, the processor operates to determine a port similarity variable for a plurality of the ports when compared to the first port, starting with the  
25 port with the largest number of logical connections and proceeding until a subsequent port would have a number of logical connections less than the largest port similarity variable already determined; and insert all ports that were determined to have the largest port similarity variable  
30 within the set of most probable ports.

8. A processing apparatus according to claim 1 wherein if there are a plurality of logical connection parameters

associated with each of the at least one ports, the processor selects one or more of the plurality of logical connection parameters to predict the at least one physical connection.

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9. A processing apparatus according to claim 8 wherein the selecting is performed with a graphical user interface integral to said processor.

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10. A processing apparatus according to claim 1, wherein to predict at least one physical connection between two of the ports within the plurality of nodes, the processor operates to predict physical connections between a plurality of pairs of the plurality of nodes based upon the results of the processing.

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11. A processing apparatus according to claim 1, wherein the at least one logical connection parameter associated with each of at least one port within a plurality of the nodes comprises logical channel information.

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12. A processing apparatus according to claim 1, wherein the at least one logical connection parameter associated with each of at least one port within a plurality of the nodes comprises a user label.

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13. A processing apparatus according to claim 3, wherein, if multiple ports are included within the set of most probable ports, a span address associated with each port is used to determine the port with which there is a physical connection.

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14. A processing apparatus according to claim 1, wherein the processor predicts at least one physical connection between two of the ports within the plurality of nodes based upon the results of the processing and based upon known  
5 physical connection information with respect to the network.

15. A processing apparatus according to claim 16, wherein the known physical connection information comprises information generated within an auto discovery procedure.

10 16. A processing apparatus according to claim 1, wherein to receive at least one logical connection parameter associated with each of at least one port within a plurality of the nodes, the receiver operates to receive stored information  
15 from a database.

17. A network manager for a network of nodes comprising a processing apparatus according to claim 1.

20 18. A method of predicting at least one physical connection within a network of nodes linked together by physical connections, the method comprising:

receiving at least one logical connection parameter associated with each of at least one port within a plurality  
25 of the nodes;

processing the received logical connection parameters;  
and

predicting at least one physical connection between two of the ports within the plurality of nodes based upon the  
30 results of the processing.

19. A method according to claim 18, wherein the processing step comprises, for a first one of the two ports,

determining at least one most probable port that the first port is physically connected to, this most probable port being the second of the two ports.

- 5 20. A method according to claim 18, wherein the processing step comprises, for a first one of the two ports, determining a set of most probable ports that the first port is physically connected to, this set of most probable ports including the second of the two ports.

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21. A method according to claim 20, wherein the determining a set of most probable ports that the first port is physically connected to comprises:

- 15 determining a port similarity variable for a plurality of the ports when compared to the first port; and  
inserting all ports that were determined to have the largest port similarity variable within the set of most probable ports.

- 20 22. A method according to claim 18, wherein the processing step comprises:

sorting the ports within the plurality of nodes based upon the number of logical connections at the ports;

- 25 for a first one of the two ports, determining a port similarity variable for a plurality of the ports when compared to the first port, starting with the port with the largest number of logical connections and proceeding until a subsequent port would have a number of logical connections less than the largest port similarity variable already  
30 determined; and

inserting all ports that were determined to have the largest port similarity variable within a set of most probable ports that the first port is physically connected

to, this set of most probable ports including the second of the two ports.

24. A method according to claim 18, wherein the at least one logical connection parameter associated with each of at least one port within a plurality of the nodes comprises at least one of logical channel information and a user label.

25. A method according to claim 18, wherein the predicting at least one physical connection between two of the ports within the plurality of nodes is performed based upon the results of the processing along with known physical connection information with respect to the network.

26. A network comprising:

a plurality of nodes linked together by physical connections;

at least one processing apparatus arranged to be coupled to the nodes, the processing apparatus operating to receive at least one logical connection parameter associated with each of at least one port within a plurality of the nodes; and process the received logical connection parameters in order to predict at least one physical connection between two of the ports within the plurality of nodes based upon the results of the processing.

27. A network according to claim 30 further comprising a database for storing the logical connection parameters;

wherein to receive at least one logical connection parameter associated with each of at least one port within a plurality of the nodes, the processing apparatus operates to receive stored information from the database.

28. A network according to claim 26 wherein the network is an optical network.